CO_2 Liquefaction - LCO_2

Description

Inlet stream from CO_2 capture:

- DAC (Direct Air Capture)
- DOC (Direct Ocean Capture)
- Exhaust gas
- Petrochemical process capture

The CO_2 liquefaction system is part of the solutions Ecospray provides to the customers **to support** their **decarbonization** journey. The system can be installed stand-alone or coupled with a carbon capture system, both for marine and land-based applications. From a carbon capture system, the **inlet CO_2** rich stream is **collected, "cleaned", dried and liquefied for industrial** (99,5%), **food or permanent sequestretion applications** (99,99%).

The liquefied CO_2 is then sent to the tank, where it remains until it is collected by the user according to the procedures set out under the international regulations. This process creates a **virtual pipeline**, connecting CO_2, emission sources and utilisation hubs **without** the need for **permanent physical infrastructure**.

Module production capacity:

- Pilot (upon request) from a minimum modular size of 1 tpd;
- Industrial scale application: up to 72 tpd module size.

Features

- **Compact & modular design** – skid/container (40-45 ft, horizontal or vertical footprint) with a flexible design to adapt to the user's available space, easy to transport, install and relocate.
- **Efficient** – moderate energy consumption for liquefaction, with operating costs mainly due to power comsumption.
- **Flexible** – possibility of partializing the production of LCO_2 up to 50% of the maximum capacity and at desired LCO_2 commercial specs (grade, pressure and temperature).
- **Safe** – operational with no dangerous or unsustainable cooling media to avoid explosion or jet fire dangers. It can be used in classified or safe areas.
- **Complete** – containers come complete with insulation, lighting, air conditioning, doors and ventilation to facilitate operating activities.
- **Unmanned** – a remote control of process variables is provided, including web based access and proper database storage, allowing remote parameters control and proper maintenance scheduling. Plant data, including alarms, are available via OPC from the operator interface system (HMI).

Process

The process consists in an initial **purification** of the raw inlet gas to clean micro pollutants, followed by a **drying unit to remove the H_2O before the compression and cooling stage reaching the liquid phase.**
Furthermore, the liquifided CO_2 - still industrial grade - is then sent in the **stripper tower to reach food or permanent sequestration grade**, collected at the bottom of the column.